

Curriculum Vitae

Alexander A. Jacques

Email: alexander.jacques@utah.edu
Website: <https://home.chpc.utah.edu/~u0790486>

Department of Atmospheric Sciences
University of Utah

EDUCATION

Doctor of Philosophy, Atmospheric Sciences, University of Utah *December 2016*

- Temporal and spatial analyses of Earthscope USArray Transportable Array surface pressure observations
- Instrumentation support and development for operational and research projects within the Salt Lake area
- Mesonet data collection, ingest, dissemination, and product development support for MesoWest

Master of Science, Applied Meteorology, Plymouth State University *May 2011*

- Lightning Detection network evaluation within vicinity of Kennedy Space Center in Cape Canaveral, FL

Bachelor of Science, Meteorology, Lyndon State College/NVU-Lyndon *May 2009*

PROFESSIONAL EXPERIENCE

Research Scientist, Atmospheric Sciences, Univ. of Utah	<i>August 2020 – Present</i>
Product Development Contractor, NVU-Lyndon/Northview Weather LLC	<i>Nov 2017 – Dec 2021</i>
Postdoctoral Research Associate, Atmospheric Sciences, Univ. of Utah	<i>September 2016 – July 2020</i>
Graduate Research Assistant, Atmospheric Sciences, Univ. of Utah	<i>August 2012 – August 2016</i>
Teaching Assistant, ATMOS 5040/6040 Env. Statistics, Univ. of Utah	<i>January 2015 – May 2015</i>
Research Associate, MesoWest/Atmospheric Sciences, Univ. of Utah	<i>September 2011 – August 2012</i>
Graduate Research Assistant, Applied Meteorology, Plymouth State Univ.	<i>September 2009 – May 2011</i>
Intern, 45th Weather Squadron, Cape Canaveral Air Force Station, FL	<i>June 2010 – August 2010</i>
Teaching Assistant, Weather Laboratory, Plymouth State Univ.	<i>September 2009 – May 2010</i>
Intern, Mount Washington Observatory, Mount Washington, NH	<i>June 2009 – August 2009</i>

AWARDS

Norihiko Fukuta Award for Outstanding Graduate Student Publication *May 2015*

SELECTED RESEARCH PORTFOLIO

Peer-Reviewed Publications

Lead Author:

- Jacques, A. A., J. D. Horel, E. T. Crosman, and F. L. Vernon, 2017: Tracking Mesoscale Pressure Perturbations Using the USArray Transportable Array. *Monthly Weather Review*, **145**, 3119-3142, [doi:10.1175/MWR-D-16-0450.1](https://doi.org/10.1175/MWR-D-16-0450.1)
- Jacques, A. A., J. D. Horel, E. T. Crosman, F. Vernon, and J. Tytell, 2016: The Earthscope US Transportable Array 1 Hz Surface Pressure Dataset. *Geoscience Data Journal*, **3**, 29-36, [doi:10.1002/gdj3.37](https://doi.org/10.1002/gdj3.37)
- Jacques, A. A., J. D. Horel, E. T. Crosman, and F. L. Vernon, 2015: Central and Eastern United States Surface Pressure Variations Derived from the USArray Network. *Monthly Weather Review*, **143**, 1472-1493, [doi:10.1175/MWR-D-14-00274.1](https://doi.org/10.1175/MWR-D-14-00274.1)

Coauthor:

- Gowan, T. A., J. D. Horel, A. A. Jacques, and A. Kovac, 2022: Using Cloud Computing to Analyze Model Output Archived in Zarr Format. *J. Atmos. Oceanic Tech.*, **39**, 449-462, [doi:10.1175/JTECH-D-21-0106.1](https://doi.org/10.1175/JTECH-D-21-0106.1)
- Follstad Shah, J. J., and Coauthors, 2021: The Wasatch Environmental Observatory: A mountain to urban research network in the semi-arid Western US. *Hydrological Processes*, **35**, 9, [doi:10.1002/hyp.14352](https://doi.org/10.1002/hyp.14352)
- Mallia, D. V., and Coauthors, 2020: Evaluating Wildfire Smoke Transport Within a Coupled Fire-Atmosphere Model Using a High-Density Observation Network for an Episodic Smoke Event Along Utah's Wasatch Front. *J. Geophys. Res.*, **125**, e2020JD032712, [doi:10.1029/2020JD032712](https://doi.org/10.1029/2020JD032712)
- Mendoza, D. L., E. T. Crosman, L. E. Mitchell, A. A. Jacques, B. Fasoli, A. M. Park, J. C. Lin, and J. D. Horel, 2019: The TRAX Light-Rail Train Air Quality Observation Project. *Urban Sci.*, **3**, 108, [doi:10.3390/urbansci3040108](https://doi.org/10.3390/urbansci3040108)
- Lin, J. C., and Coauthors, 2018: CO₂ and Carbon Emissions from Cities: Linkages to Air Quality, Socioeconomic Activity and Stakeholders in the Salt Lake City Urban Area. *Bull. Amer. Meteor. Soc.*, **99**, 2325-2339, [doi:10.1175/BAMS-D-17-0037.1](https://doi.org/10.1175/BAMS-D-17-0037.1)
- McCorkle, T. A., J. D. Horel, A. A. Jacques, and T. Alcott, 2018: Evaluating the Experimental High-Resolution Rapid Refresh - Alaska Modeling System using USArray Pressure Observations. *Wea. and Forecasting*, **33**, 933-953, [doi:10.1175/WAF-D-17-0155.1](https://doi.org/10.1175/WAF-D-17-0155.1)
- Mitchell, L. E., and Coauthors, 2018: Monitoring of Greenhouse Gases and Pollutants across an Urban Area using a Light-rail Public Transit Platform. *Atmos. Env.*, **187**, 9-23, [doi:10.1016/j.atmosenv.2018.05.044](https://doi.org/10.1016/j.atmosenv.2018.05.044)
- Crosman, E., A. Jacques, and J. Horel, 2017: A Novel Approach for Monitoring Vertical Profiles of Boundary-Layer Pollutants: Utilizing Routine News Helicopter Flights. *Atmospheric Pollution Research*, **8**, 828-835, [doi:10.1016/j.apr.2017.01.013](https://doi.org/10.1016/j.apr.2017.01.013)
- Widanagamaachchi, W., A. Jacques, B. Wang, E. Crosman, P. Bremer, V. Pascucci, and J. Horel, 2017: Exploring the Evolution of Pressure-Perturbations to Understand Atmospheric Phenomena. *IEEE PacificVis 2017*, **2017**, 101-110, [doi:10.1109/PACIFICVIS.2017.8031584](https://doi.org/10.1109/PACIFICVIS.2017.8031584)
- Horel, J., E. Crosman, A. Jacques, B. Blaylock, S. Arens, A. Long, J. Sohl, and R. Martin, 2016: Summer Ozone Concentrations in the Vicinity of the Great Salt Lake. *Atmospheric Science Letters*, **17**, 480-486, [doi:10.1002/asl.680](https://doi.org/10.1002/asl.680)

Books

Contributing Author:

Miller, S., 2020: *Applied Radar Meteorology*. Academx Press, 343 pp.

Theses and Dissertations

- Jacques, A. A., 2016: Temporal and spatial analyses of pressure perturbations from the USArray Transportable Array. Doctoral dissertation, Dept. of Atmospheric Sciences, University of Utah, 177 pp.
- Jacques, A. A., 2011: Comparison of the United States Precision Lightning Network™ (USPLN™) and the Cloud-to-Ground Lightning Surveillance System (CGLSS). M.S. thesis, Dept. of Atmospheric Science & Chemistry, Plymouth State University, 130 pp.

Dataset Repositories

- Jacques, A. A., J. D. Horel, E. T. Crosman, and F. L. Vernon, 2016: EarthScope USArray Transportable Array (TA) Surface Pressure Observations Sampled at 1 Hz Frequency. *Research Data Archive at the National Center for Atmospheric Research, Computational and Information Systems Laboratory*. <http://dx.doi.org/10.5065/D6028PRS>.

Select Conference Presentations

- Jacques, A. A., J. D. Horel, C. Johnson, S. W. Hoch, and A. McCutchan, 2023: A Review of the Summer 2022 Ozone Field Study in Northern Utah. Proceedings, *25th Conf. on Atmos. Chemistry*, Denver, CO, Amer. Meteor. Soc., 5B.5.

- Jacques, A. A., A. Kovac, J. D. Horel, and T. Gowan, 2023: Description and Generation of the HRRR-Zarr AWS Open Data Registry. Proceedings, *39th Conf. on Env. Information Processing Technologies*, Denver, CO, Amer. Meteor. Soc., 726.
- Jacques, A. A., J. D. Horel, and S. W. Hoch, 2022: Investigating Warm-Season Air Quality Concerns along the Urbanized Wasatch Front. Proceedings, *20th Conf. on Mountain Meteorology*, Park City, UT, Amer. Meteor. Soc., 11.4.
- Jacques, A. A., J. D. Horel, and C. Galli, 2021: Collection/Dissemination of Mesonet Observations to Support Wildfire Monitoring. Proceedings, *37th Conf. on Env. Information Processing Technologies*, Virtual, Amer. Meteor. Soc., 576.
- Jacques, A. A., J. T. Powell, and J. D. Horel, 2021: Meteorological Assessments for Utility Wildfire Mitigation in Utah. Proceedings, *12th Conf. on Weather, Climate, and the New Energy Economy*, Virtual, Amer. Meteor. Soc., 516.
- Jacques, A. A., and J. D. Horel, 2020: Summer 2019 HRRR PBL Heights and Winds within the Salt Lake Valley, Utah. Proceedings, *21st Joint Conf. Applications Air Pollution Met. A&WMA*, Boston, MA, Amer. Meteor. Soc., 1322.
- Jacques, A. A., D. L. Mendoza, E. T. Crosman, L. E. Mitchell, B. Fasoli, J. C. Lin, and J. D. Horel, 2020: Urban Spatial Monitoring of Pollutants using Light Rail-based Sensor Systems. Proceedings, *15th Sym. Urban Env.*, Boston, MA, Amer. Meteor. Soc., 4.4.
- Jacques, A. A., E. T. Crosman, and J. D. Horel, 2018: The University of Utah MesoWest Mesonet. Proceedings, *19th Sym. on Met. Obs. and Inst.*, Austin, TX, Amer. Meteor. Soc., 4.1.
- Jacques, A. A., E. T. Crosman, and J. D. Horel, 2018: Monitoring Air Quality Variations in Complex Terrain using a Multi-Platform Approach. Proceedings, *Air Quality: Science for Solutions 2*, Ogden, UT.
- Jacques, A. A., J. D. Horel, and E. T. Crosman, 2017: Detection of Mesoscale Pressure Perturbations with Five Minute Gridded Analyses. Proceedings, *28th Conf. Weather Analysis and Forecasting / 24th Conf. NWP*, Seattle, WA, Amer. Meteor. Soc., 11B.1.
- Jacques, A. A., E. T. Crosman, J. D. Horel, L. Mitchell, B. Fasoli, and L. Leclair-Marzolf, 2016: Mobile Air Quality Measurements on Light Rail and Helicopter. Proceedings, *32nd Conf. on Env. Information Processing Technologies*, New Orleans, LA, Amer. Meteor. Soc., 42.
- Jacques, A. A., E. T. Crosman, J. D. Horel, B. Blaylock, A. Long, and S. Arens, 2016: Real-time Ozone Measurements During the 2015 Great Salt Lake Summer Ozone Study (GSLSO3S). Proceedings, *18th Symposium on Met. Observation and Instrumentation*, New Orleans, LA, Amer. Meteor. Soc., 7.2.
- Jacques, A. A., E. T. Crosman, J. D. Horel, and L. Leclair-Marzolf, 2016: Real-time Ozone and Particulate Measurements on a News Helicopter. Proceedings, *22nd Symposium on Boundary Layers and Turbulence*, Salt Lake City, UT, Amer. Meteor. Soc., 13A.3.

FIELD EXPERIENCE

Lead Software Manager – University of Utah UUNET Mesonet	<i>September 2013 – Present</i>
Data Management Developer – UTA Mobile Air Quality Projects	<i>November 2014 – Present</i>
Data Ingest and Research – Farmington Bay Ozone Study	<i>June 2022 – September 2022</i>
Lead Technician – University of Utah UUNET Mesonet	<i>September 2011 – April 2017</i>
Data Ingest and Research – Great Salt Lake Summer Ozone Study	<i>June 2015 – August 2015</i>
Participant – Meteor Crater Experiment (METCRAX) II Field Campaign	<i>October 2013</i>
Participant – Uintah Basin Ozone Study (UBOS) Field Campaign	<i>January 2013 – February 2013</i>
Participant – MATERHORN Field Campaign	<i>October 2012</i>

SKILLS AND QUALIFICATIONS

Technological Experience

- Programming and Scripting Languages
 - Python
 - Linux Shell (tcsh/bash/ksh)
 - Perl
 - Web Design (HTML/CSS/Javascript)
- Instrumentation and Specialty Software
 - Campbell Scientific Loggernet
 - CRBasic, Edlog
 - MySQL / MariaDB
 - Apache Web Server

- Local Data Manager (LDM)
 - WinSCP
- Operating Systems and Environments
 - Linux (Ubuntu, RedHat, Raspbian)
 - Windows (7, 8, 10, 11)
 - Amazon Web Services
 - Google Cloud Platform

Current Research and Operational Initiatives

- Atmospheric boundary layer research w.r.t. multiple air quality projects in northern Utah
 - Utilization of remote sensor techniques, gridded analysis products, and mesonet observations
 - Monitoring spatial distribution of particulates and ozone via light rail, electric bus, and helicopter
 - Research assessments related to dust events, wildfires, cold air pools, and hyperlocal point sources
- Data collection, processing, and web developer for Utah Transit Authority TRAX Light Rail and Electric Bus Air Quality Monitoring initiatives
- Lead software developer and operations support for mesonet equipment operated by University of Utah Mountain Meteorology group (UUNET)
- Developer and operations maintenance of MesoWest HRRR Zarr Gridded Data archive repository
- Provide user support for University of Utah MesoWest existing suite of mesonet web products
- Contracted support for Synoptic Data PBC for mesonet data ingest and dissemination services

Prior Research and Operational Initiatives

- Researched predictive measures related to wildfire conditions for possible power system shutdown procedures as part of collaborative project with Rocky Mountain Power, Inc.
- PhD research focused on analyzing 1 Hz-sampled pressure observations from the US Transportable Array seismic network temporally (time series statistical filtering analyses) and spatially (objective analyses with complementary gridded datasets)
- Data collection, processing, and web developer for 2015 Great Salt Lake Summer Ozone Study
- Remote participant/assistance for data collection/transfer for OWLeS 2014 Field Campaign
- On-site participant for several additional field campaigns (MATERHORN, UBOS, METCRAX II)
- Independent contractor for web and data product development for Northview Weather LLC